

1109-133 Is the Use of Modified Bernoulli Equation Valid in Estimating Pulmonary Artery Pressures in Patients With Severely Dilated Tricuspid Annulus?

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Prior studies have shown that pulmonary artery systolic (PA) pressure can be measured by Doppler echo from a tricuspid regurgitant (TR) jet using the Bernoulli equation. Although this technique has been validated comparing echo with direct catheter measurements, its accuracy has not been evaluated in pts with severely dilated annulus. We sought to compare the accuracy of measures of PA pressures using echo & cath data in chronic thromboembolic pulmonary hypertension (CTEPH) pts with varying degrees of tricuspid annular diameter (TAD) dilatation. We reviewed echos of 54 CTEPH pts and measured PA pressure and TR regurgitant index (RI), the planimetric ratio of TR with relation to the dilated right atrial area. PA, RA pressures, & PVR were recorded from RHC within 48 hrs of echo. Fifty-three of 54 pts (98%) had PA pressures >50 mmHg. Echo measures of PA pressure correlated more closely with cath in pts that had TAD <5 cm (n=42, r=0.72) compared to pts with TAD >5 cm (n=12, r=0.42, p=ns). Age, PA, RA pressures, & PVR were not different between the 2 groups; however, pts with larger TAD tended to have more severe TR in light of similar PA pressures. Severe TR (RI>33%) was present in 21/42(50%) & 8/12(67%) pts in each group, respectively. CONCLUSIONS: In CTEPH pts, all of whom have markedly increased PA pressures, Doppler correlate less closely with catheter measurements of PA pressure than in prior reports. More importantly, PA pressures by Doppler correlate less closely with direct catheter measurements in CTEPH pts with severely dilated TAD than in those without severe enlargement. The mechanism for this finding may be that a "wide-open" conduit in setting of significantly dilated tricuspid annulus causes rapid equilibration and the distal velocity is NOT significantly higher than the velocity proximal to the valve.

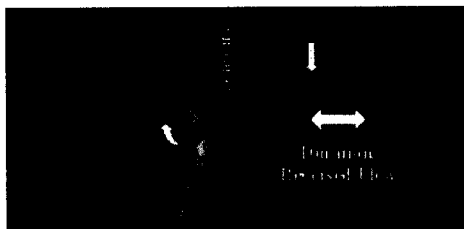
1109-134 Reversal of Blood Flow in the Descending Aorta: Implications for Doppler Quantitation of Aortic Insufficiency

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Background: Pulsed-wave Doppler echocardiography of the descending aorta is often used to assess the degree of aortic insufficiency (AI), but assumes that descending aortic flow is relatively uniform and antegrade. Three-dimensional (3D) magnetic resonance imaging (MRI) provides a highly sensitive method of studying regional variations in blood flow in vivo throughout the entire aorta.

Methods: Velocity vector fields were mapped with time-resolved 3D phase-contrast MRI, encompassing the heart and aorta in four healthy human subjects (24-61 yrs) without AI. Blood flow vectors were visualized with 3D particle traces throughout the cardiac cycle.

Results: Blood flows in the descending aorta were non-uniform and varied across subjects and throughout the cardiac cycle. Significant retrograde flow was demonstrated along the lesser curvature of the proximal descending aorta in all subjects, and was located within a discrete vortex in 3 subjects. Peak retrograde flow velocities ranged from 0.18-0.44 m/s. Retrograde flow was observed in both systole and diastole, persisting from 0.1-0.414 s during a single cardiac cycle.



Conclusion: Retrograde aortic flow is demonstrable in normal human subjects. Such flows appear in the area most often sampled by pulsed-wave Doppler studies, and may result in overestimation of AI severity. 3D phase-contrast MRI is a powerful tool for assessing complex regional flow patterns in vivo, and may elucidate the effect of valvular and vascular pathology on aortic blood flow.

1109-135 Practical Scoring System of Mitral Regurgitation Assessing the Optimal Timing of Operations: Its Predictive Value of Postoperative Cardiac Events and Functional Reversibility

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(Objectives) Accompanying high success rate of surgical techniques, we have aggressively performed mitral valve repair at earlier timing for the patients of severe mitral regurgitation(MR). This is a retrospective study to report the impact of preoperative MR point (scored by clinical features and echocardiographic data) on postoperative cardiovascular events and reversibility of cardiac function.

(Methods and Results) 182 patients with isolated prolapsing grade 3 or 4 MR who underwent mitral valve repair (mean age:54ys, median follow up period:3.5ys, percentage of follow up:98%) were enrolled. A modification of the original Cleveland clinic MR point was used, which was scored by total points of 6 parameters associated with severity of the disease, i.e. history of congestive heart failure, atrial fibrillation, pulmonary hypertension, left ventricular end systolic dimension (LVDs), % fractional shortening (FS)

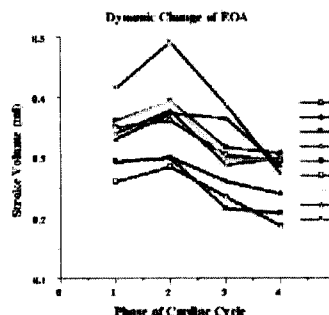
and left atrial dimension (maximum of 6 points). Preoperative New York Heart Association (NYHA) classification was I=41, II=92, III=45 and IV=4 and preoperative MR points had wide distributions in each class. Patients were categorized into 2 groups according to MR points (group L: <=3.0 120 cases, group H: >=3.0 62 cases) irrespective of NYHA and long-term cardiovascular event (re-operation, CHF and cardiac emboli) free rate was analyzed by Cox regression model. Postoperative event-free rate of group H was significantly higher than that of group L (p=0.003) and adjusted risk ratio was 3.37 (95%CI 1.49-7.566). On the contrary, preoperative NYHA classification didn't correlate significantly with the event-free rate in this study(p=0.075). Postoperative echocardiography showed larger LVDs and lower FS in group H than those in group L. MR point could also predict postoperative LV systolic function in none or mild symptomatic MR patients.

(Conclusion) MR point is a simple scoring system to integrate the total status of patients of mitral regurgitation with or without subjective symptom. It may be useful to predict postoperative event and cardiac function. Surgical recommendation may be supported by these objective data.

1109-136 Computation of Regurgitant Effective Orifice Area (EOA) Using Digital 3-D Reconstruction of Multithreshold Velocities From the Flow Convergence Region: An In Vitro Study Using Dynamically Changing Orifices Mimicking Mitral Valve Prolapse

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Background: We studied a multithreshold 3D Doppler flow convergence (FCR) method in a dynamic mitral valve prolapse model to determine dynamic changes in EOA. **Methods:** Latex orifices (lengths = 0.8mm) made to mimic different types of mitral valve prolapse (one leaflet and bileaflet) were used in our study. An ATL HDI 5000 ultrasound system and an MPT-7 TEE probe were used for 3D acquisition. The 3D datasets containing digital scanline data with color Doppler velocities from the FCR were transferred to a Silicon Graphics computer. For all orifices, 9 pulsatile flows (15-55ml/beat) were studied. The 3D FC surface area was measured on parallel slices through the 3D dataset at selectable aliasing velocities (14-67.3cm/sec) chosen to maximize the regularity and minimize lateral drop out of the visualized 3D FC at 4 points in every cardiac cycle. All values of instantaneous FCR EOA during regurgitation (EOA = 3D flow rate/CW Doppler velocities) were compared to EOA determined using instantaneous flow rates from an ultrasonic flow meter and CW velocities. **Results:** FC EOA (range = 0.08-0.56cm²) correlated well with reference EOA (r = 0.85, y = 1.07x + 0.03, mean difference = 0.03 ± 0.05cm²) with a mean dynamic increase of 35% during each cycle. **Conclusions:** The digital 3D FC method can accurately predict flow rate and thus EOA in our dynamic in vitro mitral valve prolapse model, despite temporal variability of FC size and shape.



POSTER SESSION

1132 Endocarditis

Monday, March 18, 2002, 3:00 p.m.-5:00 p.m.

Georgia World Congress Center, Hall G

Presentation Hour: 4:00 p.m.-5:00 p.m.

1132-131 Racial Differences in Endocarditis Treatment and Outcome

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Background: Little data is available regarding racial differences in the treatment and outcome of endocarditis. **Methods:** We reviewed a 20% random sample of all Medicare discharges (age ≥65 years) with a principal diagnosis of infective endocarditis from 1985 through 1999 (N=18,465). Comorbid conditions, length of stay, valve replacement, and survival were determined for each race group. Logistic regression was used to determine the association of black race with valve replacement and survival after adjustment for comorbid conditions. **Results:** Compared with white patients, black patients were younger (74 ± 8 vs. 76 ± 7 years, p<0.001), more likely to be female (57% vs. 49%, p<0.0001) more likely to have renal dysfunction (13% vs. 9%, p<0.0001), staphylococcus infection (26% vs. 22%, p=0.001), and sepsis (39% vs. 32%, p<0.0001), but were less likely to have heart failure (28% vs. 31%, p=0.008). Blacks were less likely to undergo